

REMARKS

Applicants' respectfully request reexamination and reconsideration of the application in view of the following remarks.

Applicants' cancel appreciates having the opportunity to conduct a telephone interview with the Examiner and his supervisor on September 10, 2003 in order to discuss the claims and prior art references.

Please cancel claims 1-16 without prejudice.

Please add new claims 17-42.

The Examiner has objected to claims 1-16 because of informalities.

Applicant respectfully requests that the Examiner withdraw the rejection in view of Applicant's cancellation of claims 1-16.

The Examiner has objected to claims 3 and 6-11 under 35 USC §112 as being indefinite.

Applicant respectfully requests that the Examiner withdraw the rejection in view of Applicant's cancellation of claims 1-16.

The Examiner has rejected claims 1-4 under 35 USC §102(b) as being anticipated by Bonard et al. in that Bonard discloses a method of dispersion of nanotubes in aqueous solutions by the combination of dispersants and sonification.

Applicant respectfully traverses the rejection and requests that the Examiner withdraw the

rejection in view of the following remarks.

Applicant has canceled claims 1-16, but has added new claims and believes the Bonard reference can be differentiated from Applicants' invention as claimed for the following reasons:

We agree with the Examiner that Bonard does not explicitly teach the order in which the nanotubes and dispersant are added to the solvent. Moreover, the Examiner has alleged that it would be obvious to add the nanotubes and dispersant in any order.

The Bonard reference teaches a method of purification for separating nanotubes from nanoparticles and the like and size-selecting by controlled flocculation (page 830, lines 22-26), whereby Applicants claim a method for stabilization of nano particles in fluids for industrial use. Moreover, as set forth on page 830, lines 3-4, the article teaches the removal of the surfactants after separation, contrary to the claims of Applicants' method.

The Bonard reference appears to be limited to aqueous applications, wherein Applicants' new claims are for oil based dispersions.

The Bonard reference at page 1, column 2, lines 20-21 states that suspensions formed by his methods may be stable for years; however, the statement is not supported by any data. In fact, his experiments appear to be conducted over a period of hours if not minutes, as illustrated at page 828, column 1, lines 7-13 and column 2, lines 1-3.

Applicant sets forth with particularity on page 7, lines 29-32 and page 827, lines 1-3 that there is an advantage to adding the dispersion prior to adding the nanoparticles as claimed by applicant's amended claims. The dispersant forms a stable matrix for the nanoparticles to be added. If the nanotubes are added first they will bundle together and further addition of dispersant may cause local variation of the dispersant molecules which may even result in settling instead of dispersion. It seems that the cited reference refers to problems associated with the aggregation of nanotube particles

in a solvent based solutions as set forth in column 2, on about lines 40-50 of page 1 and also in water based systems.

The Examiner has rejected claims 5-6, 8, 11 and 13-16 under 35 USC §102(b) as being anticipated by or in the alternative as being obvious over Bonard et al.

Applicant respectfully traverses the rejection and requests that the Examiner withdraw the rejection in view of the cancellation of the claims 1-16 and the following remarks.

The Examiner has pointed out that Bonard reference teaches the use of surfactants having a HLB value of greater than 10 in aqueous solutions and less than 8 in solvent solutions.

In addition to Applicants aforementioned statements, Applicants new claims do not claim an aqueous solution. The client also notes with respect to Bonard's use of the surfactant having an HLB of less than 8, that he stated on page 827, at about line 40 that "In ethanol (and in methanol and acetone as well), particles were not dispersed and formed big aggregates of about 100  $\mu\text{m}$ , which sedimented rapidly." Thus the reference teaches away from the successful methods of forming stable carbon nanotube dispersions in an oil or petroleum distillate based solution.

Regarding the Examiner's comments on viscosities, Applicants control the viscosity of the oil based dispersions by the addition of viscosity improvers as set forth on page 20, lines 28-29 and page 21, lines 1-25.

The Examiner has rejected claims 1-2, 4-5, 7-8, and 12 under 35 USC §102(b) as being anticipated by Davey et al. .

Applicant respectfully traverses the rejection and requests that the Examiner withdraw the rejection in view of the cancellation of the claims 1-16 and the following remarks.

The novelty of the Davey reference appears to be the purification of nanotube soot by using a polymer having a coiling structure to extract nanotubes without damage to their structure. The nanotubes are extracted from the solvent as soon as possible by decanting, whereas Applicants' stable dispersions are utilized to maintain the nanoparticles in solution for a prolonged period of time to take advantage of the physical and chemical properties of the nanotubes in a solution. The reference stipulates at page 3, line 17 that the organic material has a coiling structure, more particularly poly(m-phenylene-co-2, 5-dioxy-phenylenevinylene. Applicant do not claim the use of this novel material nor require it for providing a stable nanoparticles dispersion. Davey states on page 3, paragraph 0012 that:

"Preferably the organic material has a coiling structure. The term "coiling structure" as used in this specification means a structure which facilitates the organic material wrapping about the nanotubes, that is capable of forming structures which wrap, coil, curve or bend around the nanotubes. The material may form strands and/or ropes for this purpose."

Contrary to the teachings of the Davey reference, Applicants point out in the specification at page 7, lines 5-10 that: "The term "dispersant" in the instant invention refers to a surfactant added to a medium to promote uniform suspension of extremely fine solid particles, often of colloidal size."

Moreover, as set forth on page 6, line 20, the reference teaches that the nanoparticles settle after sonification which is the opposite effect claimed by applicants. The reference promotes using a surfactant having an HLB value of less than 8 to cause the nanoparticles to settle rather than remain suspended as claimed by Applicants.

The Examiner has rejected claims 13-14 under 35 USC §102(b) as being anticipated by Davey et al. .

Applicant respectfully traverses the rejection and requests that the Examiner withdraw the

rejection in view of the cancellation of the claims 1-16 and prior remarks.

Applicant asserts that the cited reference does not include all of the features of Applicant's claimed invention and that the remaining claims as amended are patentable over the cited references.

For all of the foregoing reasons, Applicant submits that the claims are patentable over the cited references and that the application is in condition for allowance. Accordingly, Applicant respectfully requests prompt reconsideration and receipt of the formal Notice of Allowance.


If the Examiner believes there are other unresolved issues in this case, Applicant's attorney would appreciate a telephone call at (502) 452-1233 to discuss any such remaining issues.

Please charge the fee for the petition for the extension of time in the amount of (\$930) to Counsel's deposit account together with the fee of \$468 for the additional dependent claims over 20 totaling \$1,398.00. Please charge for any underpayment or credit and overpayments to Counsel's deposit account 50-0642.

Respectfully submitted,

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SEP 22 2003

  
David W. Carrithers  
CARRITHERS LAW OFFICE  
One Paragon Centre  
6060 Dutchman's Lane, Suite 140  
Louisville, KY 40205  
Telephone (502) 452-1233  
Reg. No. 35,475

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